HEALTH

EDITED BY

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Notes by the Way

"Health is the foundation of all our physical happiness."—*Herder.*

In connection with the subject of cremation, which Mr. Mattieu Williams recently discussed in a note contributed to Health, it may be of interest to note that Sir Spencer Wells, the famous surgeon, writing concerning this practice says, the "Cremation Society of England" is ready to place its furnace (or "crematorium") at the disposal of those who desire this means of converting the bodies of their friends into dust. The action of the society is founded on the recent decision of Mr. Justice Stephen in the Welsh case, that cremating a body is in itself not an illegal act, provided it be carried out so as to avoid all nuisance. Those persons who may favour this practice of disposing of the dead have therefore an opportunity of having their wishes carried into effect. In many cases we are persuaded the want of cremating apparatus has prevented those who approve of this method of "burial" from fulfilling the wishes of diseased friends. Cremation, in truth, as a substitute for burial, has never had a chance of submitting its claims to public favour. To argue that the nation is against cremation is absurd, since, as a rule, people have had no means of judging of the merits or demerits of the practice.

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We frankly confess that, to our mind, cremation is the *beau ideal* of a sanitary practice. It disposes easily, quickly, and decorously of the dead body. It destroys all chances of the propagation of infectious diseases. Think, in face of the "germ theory" and its revelations, what a mine of infection every cholera-laden cemetery must be! It prevents pollution of the soil. It conserves the interests of the living, while it deals tenderly and respectfully with the dead. It would save acres upon acres of valuable land near cities from being rendered permanently useless for the living; and lastly, it would tend to simplify all the needless ostentation and high expense which attends the modern burial rite. Questions of sentimental kind—which we are very far indeed from despising—will, undoubtedly, enter into the consideration of cremation *versus* burial. But the good sense of the public, which, after the full discussion of any theme, is usually guided to a safe issue, would, we are persuaded, decide in favour of cremation. If we may be permitted to say so, all questions of sentiment in favour of burial, must surely give way when we reflect that as things are, there is no "earth to earth" principle involved in ordinary burial practices. In face of the "corrupting mould" of the ordinary burial-place, there are few we are persuaded to whom the idea of cremation is not infinitely preferable to that of burial. And, as we have remarked, it is by cremation alone, that many health-questions which press so hardly upon us in these modern times, can be fully and readily solved.

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Dr. Cameron's Bill to regulate the practice of cremation will be brought before the House of Commons next month. It is backed by Sir Lyon Playfair, Sir John Lubbock, Mr. Howard, and others. One interesting fact remains to be noted, namely, that in Italy, clerical opposition to cremation has ceased. In Milan, 130 bodies have been cremated within the past two years. In Rome, the practice is steadily on the increase.

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The prospectus of "A Society for the Enforcement of Sanitary Laws and the Improvement of Dwellings" is published in the *Nineteenth Century* for the present month. The Committee consists of the Baroness Burdett-Coutts, Miss Octavia Hill, Lord Shaftesbury, Lord Dunraven, Sir Richard Cross, M.P., the Right Hon. G. Shaw-Lefevre, M.P., Mr. Samuel Morley, M.P., Mr. Burt, M.P., the Rev. S. Barnett, Mr. H. O. Arnold-Foster, and Mr. James Knowles.

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The main feature of the Society's *locus standi* is that of enforcing the provisions of existing sanitary laws. In this respect the society has a firm and rational basis. It does not wait for future legislation, but maintains, rightly enough, that most of the evils of which the poor complain can be remedied by laws at present in operation, but too often unknown or unacted upon. Influence and personal aid are wanted rather than money, a feature which should at once place the society in a highly favourable light before the public. The hon. secretary is Mr. James Knowles (of 17, Albert Mansions, Victoria-street, London, S.W.), who invites "information, authenticated by names, dates, and addresses, as to any particular cases of hardship or misery (in London) which are traceable to evasion or neglect of the existing law." Here is a chance for the practical emendation of sanitary evils which we trust may largely be taken advantage of by all interested in the improvement of the London poor.

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The important question, "Can any system of filtration of water be depended upon for the destruction of disease-germs which may be therein contained?" is ventilated in the present number of Health, in a letter from the "Spongy Iron Filter Company." We have expressed the opinion, that no system of mere filtration can *destroy* disease-germs—that nothing short of actual chemical destruction of such germs could render germ-laden water harmless. We have asked our correspondents to favour us with any evidence they may possess, regarding the destructive powers (on germs) of any system for filtering water. We shall publish such details in full, should they be submitted to us. At present, filtration may, and does certainly accomplish a very great deal in the purification of water, by removing particles of foreign matter and by clearing water from mud and other extraneous materials. But to actually destroy living germs—say of cholera or typhoid fever, which are propagated by water—measuring

the five or ten-thousandth or so of an inch in diameter, something more than mere filtration, as commonly understood and practised, is clearly required. We may raise "the battle of the filters" over again, it is true; but if we can induce the filter-makers to supply the public with evidence of the advantages of their inventions, so much the better, both for the public and the filters.

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A correspondent of the *British Medical Journal* gives the following highly-illustrative case in support of the protective influence of vaccination:—In July last the correspondent was called to see a lady suffering from small-pox. Her husband and three children were unvaccinated. The father and two elder children were vaccinated when the eruption had appeared on the mother, but the youngest child was left unvaccinated on account of its delicate health. The results were that the mother made a good recovery; that the unvaccinated child died from small-pox on the fourth day of the eruption; and that those who were vaccinated escaped infection entirely. Anti-vaccinators will kindly make a note of this case, and explain away the protective influence of vaccination—if they can.

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We are glad to observe that at a recent meeting of the Paddington Vestry, a committee was appointed, on the motion of Mr. Mark Judge, to provide suitable lavatory accommodation for both sexes in every part of the parish. That such a movement will supply a long-felt want, and that it is, moreover, a health-reform which deserves to be imitated in every city and town, goes without saying. There is no city worse provided in such matters than London itself; but of most other towns the same remark may practically hold good.

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The question of "over-pressure in education" is not, it seems, to be allowed to lapse into oblivion. The *Lancet* has a timeous leader on the subject in its last issue, and therein quotes a pregnant remark, emanating from Sir Andrew Clark, that 10 per cent. of the youths who compete for places in the Indian Civil Service became affected with albuminuria—a very grave kidney-disorder. "Enough is known and seen every week," says our contemporary, "by medical practitioners to prove that schools may make or mar the future of children to an extent which brings them into the front of sanitary influences. The problem for statesmen is to arrange public education so that it shall be a physical as well as an intellectual gain to the nation." We recommend our contemporary's words to the thoughtful reflection of statesmen, teachers, and parents alike.

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An interesting piece of information has recently been communicated to the Academy of Sciences by M. Pasteur. That distinguished scientist stated that *rabies*, or canine madness, could be communicated to a healthy dog by inoculating it with marrow or nerve-tissue taken from a rabid dog. As *rabies* is the canine disease which produces hydrophobia in man, the importance of the discovery can readily be estimated. M. Pasteur further stated that he had rendered twenty dogs proof against *rabies* by inoculating them with the poison of the disease, which poison, however, had been modified by cultivation. Something of the same kind was performed by M. Pasteur in the case of the "splenic fever" of cattle—as was fully described, indeed, in the articles on "The Germ Theory" published in our first volume.

Original Essays

"Life is not to live, but to be well."—*Martial.*

DISEASE GERMS AND THEIR RELATIONS.

By Dr. H. Fol of Geneva.

(Translated from the *Journal de Genève.*)

None of the living substances which form an essential part of our sustenance, and are useful in a thousand ways, can be kept for more than a few days—fermenting and spoiling, they are the despair of the economists. In this process of decomposition, the substance becomes filled with an immense number of very minute living beings. How can a liquid like milk or soup, free from all outside germs, become invaded in a few hours by these innumerable legions of germs? The first theory suggested is, that all these living particles are the *result* of the decomposition, and that they are produced spontaneously (*i.e.*, without parent-germs) at the expense of the altered substance. This is the theory of "spontaneous generation," so vigorously maintained by Pouchet; and it is certainly one of the greatest of Mr. Pasteur's good offices that he has refuted one by one the arguments of the supporters of this attractive theory, and pursued them to their last defence with his invincible logic and his unexceptionable experiments.

The fermentation is produced by the germs or *microbes*, as they have been called; and these, by a wonderfully rapid propagation, are derived from germs carried by the air, or adhering to the vessels which hold the fermentable liquids. The diligent researches of M. Miquel show that the comparatively pure air of the suburbs of Paris holds from a hundred and fifty to a thousand living germs per cubic mètre. In a hospital at the centre of the capital, each cubic mètre of air contains from five thousand to thirty thousand, according to the season. Although these figures appear prodigious, they are nevertheless very small, compared to the number of germs which cling to all the solid objects surrounding us. A simple cleansing is powerless to remove them; only fire or strong disinfecting solutions can destroy them. A fermentable liquid can be preserved indefinitely if it is protected from all microbes; but it is easily seen, after what we have just said, how difficult it must be to obtain this perfectly protected state. All these lower vegetable types are found in two forms—1, the vegetative or active form; and, 2, the passive form, that is, the *spores*, which play here a part analogous to that of seeds in plants.

In the active state most microbes show little endurance. Many species cannot stand a drying of any duration; and in moisture a temperature of 70 deg. to 80 deg. C., continued for two or three hours, destroys them almost without exception. The spores or young forms are more hardy; boiling water does not kill them; but, for this purpose, water must be heated to 120 deg., 130 deg., and even 150 deg. When dry, the spores do not succumb to a temperature below 180 deg. to 200 deg.; and, according to Mr. Fricz, cold of 110 deg. has no effect upon them. To disinfect clothing without burning would, then, be an impossibility, if, fortunately, Mr. Koch had not discovered that the germs cannot resist the action of a continued current of steam at a temperature of 100 deg.

It is peculiarly difficult to protect a liquid from all germs, or to destroy all those which have penetrated it; however, it is possible, and the liquid is then said to be *barren* or sterilised. Certain soups are so prepared that they may be sown with very small particles of substances con-

taining the microbes to be studied; and thus the desired species obtained, to the exclusion of every other. Laboratories devoted to these studies annually distribute very large quantities of these soups.

The organisms which here claim our attention belong to three families, all allied to fungi — *moulds*, *yeasts*, and *microbes* proper. Each kind of fermentation is produced by a certain species of these small organisms, and takes place, only if the species in question is present in the liquid, from the beginning of the fermentation, in sufficient numbers not to be choked by other species. Thus the special plant or fungus of wine is found in abundance in the flower of the bitter grape, and is naturally scattered in the "must" which flows from the press. In Japan the vine grows with wonderful rapidity, and bears magnificent grapes; but the fungus is lacking, and the fermentation produced by the other microbes yields only an undrinkable liquid. Bakers and brewers know very well how to introduce into their dough and must the species needed. Without microbes milk would not curdle, cheese and vinegar would be unknown; the vegetable *débris* would not decompose, and there would be no loam. Some one has calculated that a gramme (about 16 grains English) of soil contains a million of these little creatures. We are so accustomed to associate the word "microbes" with the most dreaded diseases, that we lose sight of the important part they play in nature. We can confidently say that their suppression would completely overthrow the present order of things.

The power of causing fermentations is certainly one of the most curious phenomena which these lower vegetable types present. This power belongs only to certain species. Mr. Pasteur was the first to discover that certain microbes live in the air and breathe like animals: these do not produce fermentation. Others live only when protected from the air, and cause fermentation in the matter which contains them. To these two classes there has recently been added a third, amphibious microbes, simply vegetating while in the air, and producing fermentations only when the air is withdrawn. Fermentation thus seems to be a kind of respiration or breathing. The yeasts decompose liquids in order to obtain products rich in oxygen, which take the place with them of respirable air. These facts are highly important in explaining the mechanism of diseases.

(*To be continued.*)

STORIES OF SCIENCE AND CRIME.

EIGHTH PAPER.—A WONDERFUL CASE OF STARVATION.

The following case, given by Dr. Cutter, of Boston, is extremely interesting. We quote Dr. Richardson's account of it, and also present figures of the Ainos race, referred to in the account:—

The Ainos, the Indians of Japan, are stout, thick-set, very hairy, and with very marked muscular development. They take very little sleep. Their digestive and assimilative powers are most excellent. They require only half as much rice per day as the Japanese coolie (about three-fourths of a quart instead of a quart), and, without making it up with fish or meat, the Ainos will do more, and endure more hardship. Upon such a diet they will carry two-thirds of their weight on their backs; will cover eighteen to twenty miles per day through swamps and over hills; will continue such exertions for a series of days, and yet keep their condition under the influence of an atmosphere surcharged with moisture on a July day.

The Japanese boatman, on a diet of boiled rice and weak tea, with a kind of pickled radish, not unlike dock-root, for a relish, will row or pole for hours without intermission; upon a similar diet, with an occasional bit of dried fish, he will whirl you along in his two-wheel "Pullman" at the rate of four to seven miles per hour. These men have been known to draw an adult Japanese gentleman fifty to sixty miles in one day, the same man going the entire distance. "I am credibly informed," says Dr. Cutter, "that a Tokio man drew one man ninety miles in twenty-four consecutive hours."

An aged Aino.

On March 22, 1880, one of these, named Soma, aged fifteen years, accompanied by two young men, sixteen and eighteen years respectively (a child in Japan is called one year old when born), left Tenischari to walk to Sappow, a distance of twelve miles. Just before starting, about twelve at noon, the travellers partook of a lunch of rice, pickled radish, and tea. Each took with him two handfuls of boiled rice. One had, in addition, enough ginger, pickled in plum vinegar and salt, to serve for a relish for two meals. They had no alcohol or tobacco. Each had a small half-blanket in addition to the dress of their class—a cotton towel over their ears, an under-garment like a tunic reaching to the knees and opening in front, with large sleeves of simple cotton, into which the hands can be drawn, a cotton

Scott's Midlothian Oat-Flour.—Messrs. Scott, of 82, York-street, Glasgow, have prepared a singularly pure and nutritious "Oat-flour," which bids fair to take high rank among the food products which are specially adapted for infants and invalids, and for the use of dyspeptics in particular, whose digestion is weak, and whose stomachs refuse to assimilate foods of ordinary kind.—Ed. Health.—[Advt.]

wadded kimono, and a rough Aino coat made from the inner bark of a tree; cotton leggings, cotton shoe-socks, and straw sandals.

Owing to falling snow they lost the path. After wandering about until objects were scarcely visible, they sat down on the snow in the high swamp grass and ate all the rice they had with them, as well as most of the pickled ginger. They soon sank to sleep. That night, according to the records at the weather station of Sappow, the wind was direct from the ice-bound Gulf of Tartary, minimum temperature 24° Fahr. In the morning they had no sensation in their feet or legs; they were unable to move from their resting-place. On the 23rd, 24th, and 25th they disposed of all their food. On the night of the 28th the eldest ceased to speak. On the next day the middle one spoke his last audible words. From this time Soma lay in the

An Aino Indian.

same place, eating snow while it lasted, sipping water out of the adjacent pool, gesticulating and shouting to keep his companions, the carnivorous crows, from their prey, having one desire—"to get home." These occupations filled his conscious hours. On account of the constant pain in his legs he did not sleep well.

On the morning of April 19, attracted by the swarms of crows circling about and perched on the neighbouring trees, searchers found the two dead men, and Soma speechless, pulseless, scarcely able to comprehend the saving party, staring at them with a vacant expression. They crushed some cold rice, added a little water, which they placed in his mouth, and a little of it reached his stomach. He was wrapped in blankets, and on a rude blanket-litter reached the hospital at 5 p.m., April 19, twenty-eight days from the time he left Tenischari, and twenty-five days since the last pickled ginger was eaten.

When he reached the hospital he could not speak, opened his mouth with great difficulty, and could not project his tongue, which had a white coating. Movements of the chest and abdomen could scarcely be detected; a low respiratory murmur could be heard; there was no pulse at the wrists; the impulse of the heart was very feeble; the valve-sounds were indistinct; there was profound torpor of the brain and intellectual faculties; the body was excessively emaciated; fat and flesh had vanished; the abdomen was retracted; the eyes were sunken deep in the sockets; and there was no reflex action of the arms or limbs when they were irritated. The lower part of the back was black, the feet were also black, and both legs were dead as far as the middle third.

Under the influence of warmth, stimulants, and mild food the pulse returned to the wrists next day. Upon the third day he was able to answer a few questions, but slowly and with a very low and indistinct voice. He steadily progressed, intellectually and bodily, his appetite fairly and gradually improving, and his wan and vacant look slowly vanishing. His mind became quite buoyant.

During the twenty-eight days of exposure the lowest daily "minimum" temperature was 18° Fahr.; the average minimum was 33·6° Fahr. The lowest daily "mean" was 26·67° Fahr.; the highest mean 47·6° Fahr.; and the average mean 37° Fahr. On six of the days it snowed; upon five of them it rained; but few of them were cloudless, genial days.

The young man Soma is of medium stature and weight, of fair physique, and is inured to daily labour and exposure in his northern land. He belongs to the "soldier class."

We see in this example a more remarkable experiment than that by Tanner, and even more remarkable than the starvation case of the stonemason at Cusano, who is reported to have voluntarily starved himself to death in thirty days, rather than pass four years in the prison to which he had been condemned for penal servitude.

A Valuable Invention.—It is gratifying to learn that Mr. R. Adams, of 17, Blackman-street, London, S.E., whose fanlight-openers and silent door-springs are being extensively used, has received large orders for his Patent Reversible Window. The sashes, although they slide up and down in the usual way, can be instantly turned inside out, enabling anyone to clean each side of the glass with ease, while standing in the room.—[Advt.]

SANITARY GOSSIP.

By Dr. Thomas J. Hutchinson, F.R.G.S.I.

(*Corr. Mem. of Anthropological Society at Florence, &c., &c.*)

"An I prate of things here and there,
'Tis only *Gossip*."

WATER.

Amongst the ancient Egyptians the bath was practised as a rite, and in making it a religious ordinance it may be inferred that Moses had in view the prevention or more speedy cure of those skin diseases so prevalent in the East. All the wealthy Jews in these times throughout Palestine had baths in their houses, and we know how extensively the bath was used by the Pagan Greeks and Romans in connection with their gymnasia. At some periods of its history there were more than 850 public baths in Rome. "The great sanitary law," said Sir Lyon Playfair, some few years ago in the House of Commons, "is wash and be clean, and anything which stood in the way of observance of that law, impaired the health of all communities." The necessity for ample supply of pure water is evident, when we come to consider some facts about it.

The quantity of water daily required for an adult is, on the average, from one-half to seven-tenths of an ounce for

every pound weight of the body. A man weighing ten stone uses about eighty ounces, or eight imperial pints, of water per day. This includes nearly thirty ounces that constitute part of his solid food; and the rest is consumed in a liquid form. The minimum amount of water daily required in order to maintain health—and this includes what is needed for personal ablutions, washing clothes and rooms, and for cooking—is four gallons per head. To perform these operations thoroughly requires about twenty gallons, and with this quantity complete hip and shower baths may be taken freely. Thirty-five gallons per head per day supplied to a house will be found ample for every contingency needing use and application of water. This includes the nine gallons per head which Dr. Parkes tells us are necessary for purposes of sewage, outside of the matters which I have already detailed.

In Dr. Cameron's "Lectures on the Preservation of Health," published many years ago, he advocates a daily bath, or sponging the body with soap and water. "Considerable friction," he adds, "*may* be employed to get rid of the worn-out cuticle, and to cause the blood to circulate briskly through the true skin, thereby stimulating its true functions." My thirty-five years' experience of the daily tub impresses me that friction not only *may* but *must* be employed to make the daily wash useful. There is always a quantity of exuded animal matter on the skin. And when we remember what eminent physiologists, such as Levoisier, Seguin, Simon, Krausse, Erasmus Wilson, and Milton have told us of the number of pores in the skin of a man of ordinary height, and of the length of sweat tube, we must feel it necessary to keep these clear for their functions, which a simple sponging cannot effect. Seven millions of pores in the skin, all opening to the outside, through a length of tubing that if joined together would extend to nearly twenty-eight miles! Eight grains of perspiratory vapour are exhaled through the skin in the course of every minute of our normal existence—a quantity equal to thirty-three ounces in twenty-four hours.

To prove how essential is water to our existence, Dr. Cameron tells us that the larger portion of the matter introduced into our stomachs is composed of water. So that a man weighing fourteen stone, if dried at a temperature of 272° Fahr., or squeezed in a hydraulic press, would lose nearly ten stone of his weight. The fact may appear something of the *reductio ad absurdum*, but it is, nevertheless, true. The mobility of the body is chiefly due to the large amount of water contained in it, and if the supplies of this most essential fluid be cut off, death of the most painful kind ensues.

The Chinese have been long acquainted with the value of artesian wells, and thus practically prove their good habits. I hope that I shall not be considered guilty of professional heresy in saying that the system of medicine pursued by the highest personage in the Flowery Land may be considered a wholesome one. The Emperor of China is said to pay his doctors as long as he is in good health. But as soon as he falls sick he orders their salaries to be stopped. No doubt the history of the old times would produce some queer vagaries of medical practice if they were brought to light. Not a few perhaps of the type of Dr. Sangrado, who cured or killed his patients by bleeding and hot water; or of the Dutch surgeon, who is spoken of in Western Africa, and whose practice was to give to the sick, prostrate under the low fever of the coast, doses of calomel by the teaspoonful. It must have been in some of these epochs there flourished in some of the English shires, of which I forget the name and location, a medical practitioner, whose physic must have been bad indeed if it resembled the grammar and rhythm of his verse. His name was I. Lettsom, and he had the following notice painted over his surgery door :—

"When anybody comes to I,
I physics, bleeds, and sweats 'em,
If after that, they choose to die!—
Why what care I? I Lettsom."

The joke of this was, no doubt, intended for the sound of the doctor's name in letting his patients die, if they chose. But it may be doubted if there was anything like a joke in the treatment to nine out of every ten of those who were "physicked, bled, and sweated."

Thankful we may be that we are coming to different times. The great sanitary reformer, Mr. Edwin Chadwick, told at Northampton (on the 18th of April, 1878) how more than forty years ago, Dr. Wilson, of Kelso, at the conclusion of a report on the sanitary condition of the labouring classes in that town, spoke of a better era to come, with extended knowledge of the laws of sanitation and energetic action to put them into practice :—"When man shall be brought to acknowledge—as truth must finally constrain him to do—that it is by his own hand, through his neglect of a few obvious rules, the seeds of disease are most lavishly sown within his frame and diffused over communities; when he shall have required of medical science to occupy itself with the *prevention* of maladies rather than with their *cure*; when the Governments shall be induced to consider the preservation of a nation's health an object as important as the promotion of commerce or the maintenance of conquests, we may hope then to see the approach of these times, when, after a life spent without sickness, we shall close the terms of our unharassed existence by a peaceful death-bed." Although such an Egeria has not arrived as yet, it is progressing by means of the preventible service of the medical profession; and, like other "coming events" that "cast their shadows," we can see daily looming nearer and nearer the good time delineated so eloquently by Dr. Wilson.

Victoria Mutual Assurance Society.—The annual report of the members of this society was held on the 25th ult. The report presented stated that the life-premium income and the accumulated funds each exhibited a satisfactory increase. The Chairman (T. Williamson, Esq.), in commenting upon the report, said :—"It is a great deal in these times to say that the society is progressing, for, according to a good authority—the *Post Magazine and Insurance Monitor* — forty-three other and older companies show diminished premium incomes to the average extent of six per cent." The report states that, owing chiefly to the care with which the lives have been selected, the claims were less in proportion to the life-premiums than they were as far back as 1879, and were only £170. 15s. 11d. in excess of those of that year. The work of the society is evidently conducted on a healthy basis.

Dr. Nichols' Penny Vegetarian Cookery-Book.—Every household should possess this marvel of cheapness. Free for 1½d.—Nichols & Co., 23, Oxford-street, London, W.—[Advt.]

The "Boncontour" Stay-Belt and other Orthopædic Apparatus, made by K. R. Schramm, Orthopædic Mechanician, 64, Belmont-street, Chalk Farm-road, London, W.—[Advt.]

Scott's Midlothian Oat-Flour.—There is no preparation which can be assimilated with greater facility than such a flour as this. Those who suffer from indigestion might substitute for their ordinary breakfast materials this flour, prepared according to the recipe given by Messrs. Scott and printed on the tins.—Ed. Health.—[Advt.]

The "Spécialité" Lime Juice, for family daily use throughout the year, has not the usual musty flavour; will not turn mouldy; may be obtained of Chemists and Grocers.—Feltoe & Sons, Albemarle-street, London, W.—[Advt.]

Our Papers on Popular Science.

FIFTH PAPER.

"Blessings on Science! When the Earth seemed old,
When Faith grew doting, and our reason cold,
'Twas she discovered that the world was young,
And taught a language to its lisping tongue."
—*Charles Mackay.*

EVAPORATION AND STEAM.

By E. H. Riches, LL.D., F.R.A.S.

The word evaporation is commonly understood to express the conversion of a fluid into vapour; but, vaporisation from the *surface* of any fluid or substance, is the species of conversion of a fluid into vapour, which admits of the term *evaporation*, as being more strictly applied. Thus, the phenomenon of the diminution of a body, from the surface of which vaporisation is going on by means of heat or by the action of the air, is just what is understood by evaporation. It has now been long known that the ordinary atmospheric air with which we all in common have to deal, contains steam, though in an invisible state, and this need not cause surprise to the non-scientific mind whose idea of steam, perchance, has reference to that which is commonly *seen* issuing from the kettle on the hob or from the tea-urn on the table. A very ready proof that the atmospheric air contains this invisible steam to which we have alluded is at hand, if we observe the water deposited *outside* a glass of iced water, or even if a glass be filled with water drawn from a well which is a few degrees below the temperature of the air. The evaporation, which, be it remembered, is confined to the *surface* of a liquid exposed to the air, may be stopped, as in the case of water, when oil is poured upon it. In the case of sliding gaseliers in our rooms which require water to avoid the escaping of gas, it would be well to pour a little oil on to the water, thus checking the evaporation, and consequent drying up of the water. And it may be remembered that the great evaporating process of the surfaces of oceans, rivers, lakes, &c., is ever unceasingly and silently at work; it was Faraday, we believe, who remarked that in order to produce an amount of steam equal to what would pass away from an acre of ground during one day of an ordinary English summer, it would be necessary to burn sixty sacks of coal. And this work of evaporation is ever going on, and even in the case of snow and ice, when the temperature of the air may be below freezing-point, it is still proceeding to a great extent. No evaporation can take place with respect to the surface of any body which may be perfectly dry, the presence of moisture on the surface of, or within, the body being necessary. And when we consider that this work of evaporation proceeds unceasingly and regularly with respect to the surfaces of our human bodies, and that (as was before remarked) this true evaporation is understood to exist when the vaporisation from the surface indicates a diminution of that body, upon the surface of which this evaporation is going forward, it cannot but be patent to the mind of even the ordinarily intelligent that a proper amount of necessary supply for rectifying this gradual diminution, or wasting, of the human frame, which is ever going on, is one which demands our thoughtful care. This would not be the place to explain the innumerable and perfect laws, meeting as they do the variety of circumstances of human life, upon which the wonderful system of evaporation proceeds from our cradles to our graves; but the nearer we can approach to even a fractional appreciation of them, the more punctilious it will make us, to admit of nothing in our every day's "treading out of life's measure," which can be militant against the perfect working of those immutable laws so providentially and mercifully ordained for our well-being. Just as the evaporation at the surface of water may be checked by pouring oil upon it, so the evaporation at the surface of the skin may be impeded; waterproof clothing or lack of cleansing of the skin may effect this. To see how the wearing of waterproof clothing for any length of time, under ordinary conditions, may be dangerous in the matter of checking that process of evaporation which ought to be allowed to proceed, we may here remark that if the atmosphere which is in immediate contact with the surface of water be *still* and not moved away by wind, the air itself becomes so charged with vapour *that it cannot take off any more* from this water, and so the evaporation from the surface of the water is at a stand-still. A neglect of necessary cleansing of the surface of the skin, too, may approach in deleteriousness of effect to that which ensued so fatally to a young and beautifully-formed child who was covered from head to foot with gold-leaf (non-porous) at a Parisian *fête* some years since. Ignorance of the result which would ensue led to the death of the child in the course of some twelve hours. The condition of the atmosphere has a considerable influence over the evaporation from the surface of water, for it is well known that when the air is dry and warm evaporation will go on rapidly, but as the air becomes charged with vapour, evaporation will proceed less rapidly. Here we see one of the uses of the wind, for as it removes by its force the overcharged air, fresh and drier air rushes in to proceed with the process of evaporation from the surface. The devastating and howling hurricanes with which of late we have been so familiar, have at least their uses, and if we could but always remember this, we might be led into a kindlier feeling towards what, to many of us, is irritating to the nerves, and a cause of vexation in numerous ways.

The heat of the sun in drying and warming the air renders it the more fit for imbibing moisture, in fact, just as when damp objects are exposed to artificial heat, so do we see the effect of the sun causing *vapour* visibly to ascend. The chief circumstances which influence the process of evaporation, are the extent of surface, and the state of the air as to temperature, dryness, stillness, and density. And with respect to the *density* of the air as an influence on evaporation, we may remark that pressure on the surface of liquids has a great influence over evaporation; for example, this is easily seen by placing ether in the vacuum of an air-pump, when vapour rises so abundantly as to produce ebullition. The surface of any watery liquid about 20 degrees warmer than any superincumbent air, however warm or cold that may be, will rapidly give off *true steam*, which is invisible; but as soon as it is mixed with colder air is re-condensed into water, and becomes visible in the form of very minute globules.

It is a fact worth noting, too, that in the matter of its mechanical properties, steam agrees in certain respects with common air; for example, if steam be let into any artificial space, however large it may be, it will always

Barnes's Impermeable Opium Poultice, an effective and perfectly safe application for relief in neuralgia, gout, rheumatism, painful swellings, and lumbago. Prices by post 1s. 3d. and 2s. 5d. 1 and 2, Trevor-terrace, Knightsbridge, S.W.—[Advt.]

Sanitary Inspections.—Fee for Survey and Report, in London, 2 Guineas. Estimate given and Improvement Works carried out when required.—The Sanitary Engineering Co., 115, Victoria-street, Westminster, S.W.—[Advt.]

expand enough to fill it, exerting an equal pressure in every direction; and be it remembered that when *pure* it is always invisible and without any smell.

What is theoretically called dry air, that is, air without steam, is not known to exist in nature, and we think is not to be produced by art. It must not be supposed that the visible matter popularly called steam is true steam, in fact, it should be carefully distinguished from steam proper, which is, in reality, an aëriform state of water. The former which we see is, really, a dust-like cloud of minute bodies of liquid water wafted by either a current of moist air, or of true steam.

Steam is about 1,700 times lighter than water, for we know that a quantity of water will yield nearly 1,700 measures of steam at 212° Fah.; and it may be remembered that under ordinary atmospheric pressure, a cubic inch of water expands into a cubic foot of steam at 212° Fah. When water is heated to a certain temperature, it is the tendency which it always has to expand into vapour, which constitutes what is understood as the power of steam—*i.e.*, "energy," or heat—the first of "prime movers," or, as Darwin described it, as "the giant-power, from earth's remotest caves." And just as Lord Clarendon said, with respect to the corruption of human nature, "if we did not take great pains, and were not at great expense to corrupt our nature, our nature would never corrupt us;" so with our physical organisation, perhaps it may be said that if all the physical laws which are at work within us were better understood by us, and not warred against by ignorance or wilfulness, it would proceed in uninterrupted completeness, sickness being a thing unknown, and "our hours would be golden links, God's token reaching heaven."

In the natural sequence of subjects upon which these science papers touch, from a physical standpoint and in reference to personal health so far as it is in the individual power of any to "nurse it," we are led in our next and several subsequent papers to consider the phenomena of *Heat*, and, by stating certain scientific facts in relation thereto, deduce much which will be found to be both practical and interesting.

Fresh Paint.—The current belief among householders that the smell of fresh lead paint is noxious is founded on pretty general experience, but is opposed by the belief, equally current among chemists, that lead compounds are not volatile. A fact recently brought to our notice seems to support the domestic theory. The basis of the useful and popular luminous paint is known to be sulphide of calcium. Now, this compound, when unprotected by varnish, glass, or some other impervious substance, is slowly acted on by the acids of the air, and sulphuretted hydrogen is evolved, which blackens lead paint. This is well known, and can easily be avoided by proper protection of the paint. But the curious thing is that unprotected luminous paint is found to be perceptibly blackened by the fumes from fresh lead paint. There seems to be only one possible explanation of this—namely, that a surface freshly covered with lead paint does actually emit some volatile compound of lead. We believe that many physicians could confirm this view from their own observations in regard to newly-painted houses.

Pure Water is such a vital necessity that, without it, illness is certain. None are more prone to the ill effects when impure than the young. To ensure a pure supply send a post-card to the London and General Water Purifying Company, Limited, 157, Strand, London, W.C., who will return particulars post free.—[Advt.]

The Family Circle

"The child is father of the man."—*Wordsworth.*
"In bringing up a child, think of its old age."—*Joubert.*

ECONOMICAL BREAKFASTS, DINNERS, AND SUPPERS.

By Mrs. Thwaites, of Liverpool.

SECOND PAPER.

For those persons to whom coarse oatmeal would be irritating, fine may be substituted. The following is a good way to prepare it:—Put 1 pint of milk or water to boil; mix ¼ lb. of fine Derbyshire oatmeal smoothly with ½ pint of milk; add ½ teaspoonful of salt; pour the boiling milk or water to this mixture, stir well, put back into the saucepan and boil gently for 10 minutes. Some allowance must be made for individual taste as to the consistency of porridge. The difference in the quantity of oatmeal for the above proportions would be about 1 oz., more or less. Children should have a liberal allowance of sugar.

It is a pity that food so nutritious and cheap as Indian meal should be so neglected. The better preparations used chiefly in America should not cost in England quite so much as good oatmeal; while the rough, unprepared kind, imported chiefly for the feeding of horses and cattle, is very much cheaper. It can be used for bread, porridge, puddings, &c., with perfect safety, but must always be passed through a fine wire sieve to remove husks and gritty portions. To make porridge, soak ¾ lb. Indian meal overnight in one pint of cold water, adding a teaspoonful of salt. In the morning, boil a pint of water, and pour into it the mixed meal; boil up, stirring all the time, then draw aside and simmer slowly for at least half an hour. Eat with sugar, milk, stewed fruit, &c. This preparation is largely eaten by almost all classes in Italy and America; it goes by the names polenta and mush. Cold, it may be cut into slices ¾ in. thick, and fried in hot fat. A useful little dish may also be made by baking it thus: Put the slices into a greased pie-dish with grated cheese, and salt and pepper to taste. A few little bits of butter or dripping over the top; bake in a quick oven for about 20 minutes. Bread, puddings, &c., in which Indian meal can be used will follow in due course.

Oatmeal and Indian meal show a composition as follows in 100 parts:—*Oatmeal.*—Water, 15; nitrogenous matter, 12·6; starch, 58·4; sugar, 5·4; fat, 5·6; salts, 3·0. *Indian Meal.*—Water, 14; nitrogenous matter, 11; starch, 64·7; sugar, 0·4; fat, 8·1; salts, 1·7. In oatmeal 69·4 of heat-giving and 12·6 flesh-forming, against 73·2 and 11 in Indian meal. It is plain, then, that such articles of food compare favourably with many dishes in general use and costing much more. Breakfasts of this kind are specially adapted for winter.

Dinners.—Onion Soup.—Put into a saucepan 1½ oz. butter; let it melt, and add an equal quantity of flour; mix smoothly, and add 1½ pint of the water from boiled onions (see last article); stir until it boils; add salt and pepper to taste, and a pinch of nutmeg or powdered mace. Mix the yolks of two eggs well with a quarter-pint of hot milk; add the soup; continue to stir for three or four minutes to prevent the yolks curdling. Upon no account let it boil. A teaspoonful of finely-chopped parsley, tarragon, or chervil, would be an improvement for any one accustomed to French soups.

Maccaroni and Cold Meat.—One pound of either cold beef or mutton minced or chopped very fine; a little fat should go with it. Season with a teaspoonful of salt, one-third of a teaspoonful of pepper, and a small pinch each of nutmeg and sweet herbs; a teaspoonful of finely-chopped onion may be added if the flavour is liked. Put half a pound of straight maccaroni into three pints of boiling water, add a large teaspoonful of salt; boil until the maccaroni is just soft, but not at all broken; put a layer of it at the bottom of a greased pie-dish, then a layer of the seasoned meat, more maccaroni, and so on till the dish is full; pour over a cupful of gravy, made by either breaking and boiling the bones of the cold meat or dissolving a small teaspoonful of meat extract in hot water; half a tablespoonful of sauce or ketchup, if at hand, may also be put in. Spread a thin layer of stale bread-crumbs over the top, and add a few small bits of butter or dripping; bake thirty to forty minutes.

Maccaroni is simply a paste made from fine wheaten flour, well beaten, pressed into the shapes in which we see it, and thoroughly dried. Its value may be judged by the way it swells in cooking; when good it will become three or four times its original size. The flesh-forming and heat-giving properties are rather higher than those of fine wheaten bread. Properly cooked it forms an agreeable change from pastry or vegetables.

Supper.—Stewed potatoes, 1½ lb.; peeled potatoes, cut into slices, ½ in. thick; put them into a saucepan with one small onion sliced; a teaspoonful of salt, ¼ teaspoonful pepper, a pinch of nutmeg, and 1½ oz. butter; cover the pan, and set over a very gentle heat for ten minutes; give the pan an occasional shake to prevent burning. Pour over as much milk as will just cover the potatoes, simmer very slowly till they are quite soft, put in a teaspoonful of finely-chopped parsley, and serve.

As a useful vegetable the potato ranks higher than any other, although by no means showing a composition to sustain life and health. In 100 parts of potato:—Water, 75·0; nitrogenous or flesh-forming matter, 2·1; starch, 18·8; sugar, 3·2; fat, 0·2; salts, 0·7.

The salts, chiefly those of potash, act on the general health, and the potato is thus one of our most valuable scurvy-preventing vegetables. The large proportion of starch found in the potato renders it particularly suitable to go with fat, milk, or butter-milk. It is well, where economy must be closely studied, to remember that uncut baked potatoes lose less of their nutritive properties than when boiled or steamed, and really go much further in satisfying hunger.

No vegetables are liable to so much variation as the potato. When young and waxy they are indigestible for most people, and entirely unsuited to children and invalids. The changes caused by disease, frost, and sprouting in spring, also make them more or less unwholesome. When in good condition, however, there is no limit to the cheap and wholesome dishes a thoughtful housewife can concoct from them.

Test for Calomel.—Put a little suspected calomel on a clean knife blade. Moisten with alcohol and rub with a cork. Pure calomel will not attack the steel, but corrosive sublimate, or calomel containing any sublimate, will produce black spots.

No More Gas in Daytime.—More than 30,000 of Chappuis' daylight reflectors are fitted up in London only, by which means gas is done away with, and the places rendered cheerful and healthy, added to which a considerable economy is effected. Prospectus sent on receipt of two stamps addressed to (H.) Chappuis, 69, Fleet-street, London.—[Advt.]

Healthy Houses

"A happy home must be a healthy home."—*Anon.*

HOUSE-HEATING APPLIANCES.

THIRD PAPER.

By Professor Trowbridge.

To the architect and sanitary engineer of the present day the terms warming and ventilation have certain technical meanings, and when employed together refer to systematic arrangements and appliances in the construction of dwellings, public buildings, churches, and halls of audience, by which not only may suitable temperatures be maintained in these structures, but proper quantities of pure and fresh air supplied continuously. It may be laid down as a fundamental principle that the warming and the ventilation of dwelling-places are equally indispensable to health, and that they are, to a great extent, inseparable in their relation to each other, and, ordinarily, in the appliances by which they are effected.

Four modes of heating, which furnish at the same time different degrees of ventilation, comprise all in common use, viz., the open fireplace, the close stove, the hot-air furnace, and the steam-heating apparatus. A comparison of these methods involves, for each, the cost of the apparatus and its durability, the cost of fuel and attendance, and the efficiency of the apparatus for heating and ventilation.

The open fire and the stove furnish means for a constant supply of heat, through combustion of fuel, within the room to be heated. The open fire gives off its heat to the walls and objects in a room only by radiation from the burning fuel, all the air that passes the heated surfaces of the fire-place going directly up the chimney. Hence, this method is inefficient for heating, especially when the walls of the room in which the fire is placed are greatly exposed to outside cooling influences. Moreover, much more air than is necessary for combustion passes up the chimney, from the very nature of its construction; and, as this air must pass through the room to the chimney, it is difficult in general to avoid cold currents of air. Remote corners are apt to receive little heat directly, and the full effect of the open fire for a dwelling requiring, as it must, a fire for each room, is attained only at a great expense of fuel. While the first cost of the fire-place may not be great, the cost of fuel, except when such open fires are mere adjuncts to some other system, renders this mode of heating, as houses are now constructed and occupied, quite out of the question for the ordinary householder. As regards ventilation, however, the open fire is of all systems the most admirable.

The second mode of heating, the close stove, is doubtless of all modes the most universally practised at the present day. Whether the stove be a simple structure of cast or

Medical and Sanitary Exhibition, 1881.—Award of Merit.—Diabetes. Van Abbott's Gluten Bread, and all other suitable Foods for Diabetic Patients. Dietary Tables and Price Lists post-free on application. Van Abbott, 5, Princes-street, Cavendish-square, W.—Delicate Children and Adults Suffering from Nervous Depression. Van Abbott's Hypophosphite of Lime Biscuits, for Delicate Children, especially those suffering from Deficiency of Bone, Weak Joints, or Debility, and Adults suffering from Nervous Depression. Each Biscuit contains five grains of the Hypophosphite of Lime. "Quite free from disagreeable taste, and taken willingly by Children, and certainly provide an excellent means of administering this valuable compound. Our analysis proves the accuracy of the printed descriptions on the labels of the boxes. The Biscuits were suggested by Mr. W. Adams, of the Orthopædic and Great Northern Hospitals." — *Lancet*, Nov. 4, 1876.—Van Abbott, 5, Princes-street, Cavendish-square.—[Advt.]

wrought iron, having an interior chamber for the combustion of fuel, with a plain, wrought-iron pipe to lead away the gases of combustion, or whether this simple structure be encased or provided with additional chambers and pipes for the more extended circulation of the heated gases, and to furnish the greatest possible heating surface, the statistics of manufacture alone furnish evidence that there is some special advantage in this mode of heating which commends it to popular favour. It is not difficult to account for the preference; the stove can be placed at little expense in any room of any building where there is a flue for carrying off the smoke and the gases of combustion. The activity of the fire can be modified at will to suit any degree of external temperature; and as it is generally employed with the minimum amount of ventilation, and often with almost none at all, the economy of heat is all that can be desired. But, in proportion as an active and sufficient ventilation is demanded, this efficiency of heating disappears, and, since the usual practice is to trust for ventilation to the accidental influx of air through crevices in the window and door casings, the use of a stove is quite sure to lead to a vitiated atmosphere. Owing to the fact that the heating appliances of both the open fire and the stove are confined almost entirely to the room or apartment in which the fuel is burned, the heating of a building comprising many apartments, by these methods, can only be accomplished by increasing the number of fires or stoves. The economy which might be practicable for a single room then disappears to a great extent, owing to the increased cost of attendance, as well as waste. —*North American Review.*

Glass School Desks.—School desks made of glass form the subject of a patent taken out by F. Bender, of Düsseldorf, Germany. The table is made of so-called rough glass, fine polished on one side and rough on the other. The finer side is used for writing, while the rougher is coated with colouring matter, consisting of Syrian lack, black, and some dissolved black wax. After the glass is sufficiently warmed, a thin coating of this is given and then polished with pumice.

"Of all the plans for economising space," said a patent lawyer, "the man who just left this office evolved the funniest. He had a drawing of a sleeping-car that he wished me to get patented for him. He thought it was a good thing, and would hit the railroad managers hard, because it nearly doubled the number of berths in the car. I saw right away that the beds were ridiculously short. I asked their length. 'Four feet and a half,' he replied; 'and that's plenty long enough. A careful investigation has proved to me that there is really no use in a bed being as long as the person in it. Not one man in fifty ever sleeps straightened out, and women invariably draw up their knees, so that they don't require more than a four-foot bed. It is a discovery of this fact as to sleeping that I wish to protect by the patent. I should stick up in each compartment a printed notice, explaining that the middle of the car is much safer than the sides, and therefore the closer their legs are hauled in toward the centre partition, where their head are to be, the less they are liable to be hurt by collision.'" The lawyer did not take the case. He also declined that of a man who wanted to patent a spring bottom for coffins, the idea being that, if people were so generally ready to buy easy couches for their bed-rooms, they would be still more desirous of comfort in their graves.—*New York Sun.*

Recreation and Health

"Health is the vital principle of bliss,
And Exercise of health."—*Thomson.*

CALISTHENICS, OR LESSONS IN PHYSICAL EDUCATION.

By H. C. Standage.

SIXTH PAPER.—BAR, WAND, AND DUMB-BELL EXERCISES.

"Now, girls, form up in line as you were taught yesterday.* Call out your numbers commencing from your right. Even numbers, step back two paces to the rear. Now, each select a stick from the bundle as I offer it to you that will just allow your fore-arm to be horizontal when your hand rests on the knob and the other end of the stick on the floor.† Now, you have all got sticks, bring them on the floor by your side. That's right. *Attention!*

"I want you to go through the extension exercise like you did in the first lesson; that is, I want you to swing your arms round six times in succession, first from the front and then from the rear, and then from the front again. Ready! Commence! That's right; stand at ease for a minute. This exercise it is best to perform as a preliminary to each exercise, that you may get your breathing organs into working order. Now pick up the sticks and come to attention, while I say a few words on the value of the exercise you are going through.

"In the first place the following exercises form a useful preparation for more arduous movements to be gone through later on; in the second place, their usefulness exists in inducing flexibility of the shoulder-joint; in the third place, these exercises set up the back and shoulders, preventing the latter from becoming 'round' and the chest from sinking in. Now, girls, *attention!* Bring the stick horizontally across the body, at the full extension of the arms, grasping it with the hand at either end, thumbs inwards towards each other, and consequently knuckles pointing to the front. Stand perfectly erect and throw the chest forward.

"That's right. Now, *without bending the elbow,* raise the 'wand,' as I shall now call it, above your head, and remain steady.

"Now bring the wand down *behind* you as far as you can, likewise without bending the elbows. Ah! I see some of you want longer wands. I shall have to provide some for you four feet long. You now find that when the wand is behind you the thumbs are outwards from each other; the palms likewise, and the knuckles towards your back—in fact, exactly reverse to what they were previously. Now bring the wand above your head and down in front of you again in one movement. That's right. Now go through it six times in succession, performing each movement separately when I call out, 'One, two, three.' Well done! Now try and do it in two movements—that is, without making a pause when you have raised the stick above your head, but carrying the wand behind you in one movement. Stand at ease!

"The next exercise will be for you to pick up the wand from the floor with both hands, one at either end, raise it above your head, and then lay it on the floor again in front of you. Repeat this exercise six times, and then proceed to the third exercise.

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* See Second Paper.

† For a person 5 ft. 6in. high the "wand" required would be about 39 in. long.

"This is to pick up the stick at each end, as in the last. Knuckles, of course, pointing to the front, and carrying the wand behind you in one movement, and bring it back again and lay it on the floor. Repeat this movement six times in succession.

"You may now go through these exercises with the knuckles reversed, that is, grasping the wand with the palm pointing to the front.

"Exercise Four.—Raise the wand above the head, then bring it down on each side alternately, so that it is perpendicular, remembering that the elbows must not be bent. To do this, you lower one hand to raise the other.

"The correct position for the wand to be in when it is perpendicular is for the lower hand to be as low as it can reach, fingers pointing downwards, and the upper arm being brought level with the head.

"Fifth exercise.—Hold the wand perpendicular in front of you, arms fully extended, hands about six inches apart, and grasping the wand near the middle, keeping the legs and arms stiff, move the wand from side to side, as far as you can reach, the upper part of the body partly turning at each movement.

"This will be enough exercise for to-day."

"Are there any more, Charles? I feel quite refreshed after these."

"Oh, yes, several more fascinating movements to be performed, which I will put you through in the next two lessons, between exercises with the bag and ring."

"In the exercises with the wand you will see that all the movements are done with the arms and shoulders and upper part of the body, the latter moving with lower limbs which are kept perfectly stiff and erect."

(To be continued.)

Tincture of iron, or "steel drops," is said to be more pleasant, and not to injure the teeth, if taken combined with simple syrup and milk.

Pills containing one-third to two-thirds of a grain of pure creosote are said to prove beneficial to those suffering from chronic catarrh, consumption, or spasms. The maximum single dose is three-quarters of a grain, to be taken three times a day.

Try!—Try popcorn for nausea. Try cranberry for malaria. Try ginger ale for stomach cramps. Try gargling lager beer for cure of sore throat. Try swallowing saliva when troubled with a sour stomach. Try eating fresh radishes and yellow turnips for gravel. Try eating onions and horseradish to relieve dropsical swellings. Try buttermilk for removal of freckles, tan, and butternut stains. Try hot flannel over the seat of neuralgic pain and renew frequently. Try taking cod-liver oil in tomato catsup if you want to make it palatable. Try snuffing powdered borax up the nostrils for catarrhal "cold in the head." Try taking a nap in the afternoon if you are going to be out late in the evening. Try hard cider—a wineglassful three time a day—for ague and rheumatism. Try breathing the fumes of turpentine or carbolic acid to relieve whooping-cough. Try a cloth wrung out from cold water put about the neck at night for sore throat. Try an extra pair of stockings outside of your shoes when travelling in cold weather. Try walking with your hands behind you if you find yourself becoming bent forward. Try a silk handkerchief over the face when obliged to go against a cold, piercing wind. Try planting sunflowers in your garden if compelled to live in a malarial neighbourhood.—*American Druggist.*

Our Bookshelf

"Reading maketh a full man."—*Bacon.*

INFANT-FEEDING.

How to Feed an Infant. By Benson Baker, M.D., &c. (Baillière, Tindall, & Cox, London, Paris, and Madrid.)

There is no doubt that many of the diseases and ailments from which infants suffer are caused by improper feeding, and that many of the sad sights with which we are constantly confronted in the streets of our large cities are the result of ignorance and neglect on the part of those who have had the care of these unhappy objects in their early years. And when one considers how much pain and trouble might be saved by a little attention to those things which every woman, at least, ought to know, it cannot but appear a crime when those who have the charge of children willingly pass by the means of knowledge which are brought before their notice. Dr. Baker, in the little book before us, says that many women know little or nothing about children before they marry, and that when they become mothers they are simply obliged to experiment upon their children in order to discover how they ought to be treated; and, of course, the unfortunate little creatures suffer from their mothers' ignorance.

A knowledge of the elements which enter into the composition of the body, and of the structure and functions of the principal organs that are engaged in nutrition and the maintenance of the functions of organic life, would appear to be a rational basis on which to found the theory and practice of infant feeding. It is, therefore, proposed to enumerate the more important and constant elements out of which the child is built up, with special reference to the maintenance and growth of the tissues, and the change these tissues undergo, the means by which they are supplied with new material, and the ways by which the waste or effete material is eliminated from the system. The question of feeding an infant embraces much more than the simple procedure of putting food in its mouth. It is of paramount importance that the food administered should possess the chemical constituents which are absolutely necessary for the maintenance of the heat of the body, for the formation of nervo-muscular force, the development of new tissues, and the repair of the old; and, further, the aliment should allow of that rapid metamorphosis or change in the tissues which especially takes place in healthy infant life. In order that these obvious functions of organic life may be duly performed, it is also necessary that the child should be placed under such hygienic conditions as are known to promote nutrition and growth. Therefore, the skin should be kept perfectly clean, inasmuch as it is a very important organ in eliminating those waste products which result from the digestion of food and the disintegration of used-up tissue. The protection of the skin in a newly-born infant ranks next in importance to feeding. If the bodily heat of the child be not conserved by suitable warm clothing, congestion of the highly sensitive and vascular tissues of the infant immediately takes places, and death is often the consequence. A fall in the thermometer in winter is the death-knell of thousands of the badly-fed and insufficiently-clothed children of the poor. If the skin be kept clean and warm, it is enabled to perform its duty as an organ for relieving the system of waste material. When this is not efficiently done, nutrition cannot be properly carried on. The skin and the lungs are scavengers, and if they do not do their duty, the roads become impassable, and new material cannot be delivered at its destination.

Irregularity in the feeding and inattention to the quantity given, and to the general health of the nurse, are all causes of disease in, or at least of discomfort to, infants in the earlier part of their existence. Dr. Baker is particularly careful in impressing upon mothers the necessity of keeping up their strength and vigour by good and appetising food while nursing. She should eat, he says, whenever she *begins* to feel hungry, lest in waiting for the regular meal-time she lose all inclination for food. The idea that much wine, beer, and stout is necessary and

wholesome for a woman at this time is not only erroneous, but often positively injurious. Of course, it is an idea that has taken its hold among many mothers and nurses, but it has been plainly proved that, though the quantity of milk is increased, its quality deteriorates. Another practice which has always prevailed is the administration to a nursing mother of gruels and slop-diet, thereby treating her as if she were recovering from some dangerous malady, whereas she is only experiencing one of the conditions of nature, and really requires her strength to be kept up with nourishing and wholesome food. Therefore she ought to eat as much as she desires, and whatever agrees with her is not likely to disagree with her child. "In fact," says Dr. Baker, "the sooner the mother gets back to her regular diet of three or four meals a day, composed of such articles of food as she has been accustomed to and can digest, the better both for herself and her child." Of course, there are cases where the temperament of the mother render it safer that her diet should be accurately prescribed.

As milk, and nothing but milk, is the proper food for infants, a knowledge of how to administer this nourishment by hand is necessary. No child should have meat given to it until it has *finished* teething. Much of the delicacy with which young children are troubled arises from the foolish haste which their nurses show to introduce them to a meat diet. Dr. Baker shows how worse than foolish such a practice is, adding, in conclusion:—

> It is a serious matter to tamper with the health of children, for on their health rest their future happiness and usefulness to a much greater extent than is generally recognised. "As the twig is bent, so the tree will grow." As children are nourished on the right or wrong principles, so will they grow or fade away. The greatest triumph of the medical art is so to direct and control hereditary tendencies of disease in infant life, so that when adult age is reached, inherited predisposition may be outgrown. In the words of the celebrated Hunter I close this chapter: "If you would have strong children, remember there are three requisites—plenty of milk, plenty of sleep, and plenty of flannel."

The appendix of the book contains notes on some of the common ailments of infancy, with their hygienic and curative treatment. As prevention is always known to be better than cure, the author gives mothers and nurses the wise advice rather to discover how to keep their little charges well than, by neglecting them, to allow them to fall ill and then be subjected to a system of drugging. Most of the ailments from which infants suffer might be avoided altogether by strict attention to dieting and general treatment, as not a few of the most distressing symptoms are caused by a disordered condition of the stomach and bowels, due, of course, to improper feeding. The causes of a child's inability to disgest its food may result from several sources. It may not be properly clothed, may lack good sunlight and fresh air, or the advantage of baths. It may be sleeping in a badly-ventilated room, or may be subjected to so much excitement during the day that it is unable to sleep properly at night.

> The nervous system becomes exhausted, and digestion is retarded or rendered inoperative altogether, whereas under favourable hygienic conditions digestion would proceed rapidly, and this is an essential condition of health in a growing infant. It becomes apparent that some of the most troublesome ailments of infant-life are not to be traced to the infant's constitution, but rather to the surroundings and conditions in which it lives. The observance of the laws of health are essential to the growth and development of the infant; and the neglect entails present suffering to the child, and future misery, should it grow into a debilitated man or woman.

Dr. Baker makes some very much-needed observations upon the causes of crying and whining in young infants. As a rule, when babies cry, they are at once supposed to be hungry, and food is given without the slightest consideration as to whether the little creature is already satisfied or not. When we remember that a child has no power of making his uneasiness known *except* by crying, it will be seen that the causes may well be varied. Heat, cold, tight strings, sleepiness, may all cause uneasiness (which will be manifested by crying) as much as want of food. Mothers and nurses, therefore, would do well to ascertain the *reason* of an infant's wails, and use the proper means to alleviate their suffering.

In conclusion, we cannot do better than use Dr. Baker's words, which breathe the same spirit of wise and thoughtful consideration and clear common-sense in which his whole book is written:—

> Parents should not only strive to know the physical constitution, but also the mental and moral disposition of their children. By so doing a wise and happy restraint and indulgence could be exercised for the present comfort and future good of all. There would thus be secured less crying in the nursery, and less bitter weeping in future homes.

Corn, Wart, and Bunion Cure.—Mix 16 fluid ounces of collodion with 2 oz. (avoir.) of salicylic acid, and, when this is dissolved, add 1 oz. (avoir.) of chloride of zinc. Keep it tightly stoppered and away from lights or fire.

A Medical Attendant's Bill.—"I understood you to say that your charges would be light," complained a patient when his doctor handed him a tremendous bill. "I believe I said my fees would be nominal," was the reply, "but——" "Oh, I see," interrupted the patient, "*phe*nomenal!"

"A Living Death."—A story has been going the round of the newspapers, which has been supposed to be "a singular instance of the inability of even medical men to distinguish between trance and actual death." As, however, it appears that no medical man was consulted on the point, the train of reasoning by which this conclusion was arrived at is not very evident. The case, however, is one of some interest, and we are enabled to give the following authoritative account of it. The patient was a young girl, aged 14, who first came under treatment two months ago; she was suffering from acute phthisis, complicated at the time by pleurisy and pneumonia; no unusual symptom occurred until about a month later, when she was seized with convulsions of an epileptic character; these yielded to treatment in a few days. On Jan. 8, the assistant of the gentleman who had been attending her was met at the door by the patient's mother, with the statement that her daughter had suddenly died at about a quarter to four in the afternoon; he was told that she threw up her hands, stretched herself very stiffly, and ceased to breath; her mother and two other neighbours came to the conclusion that she was dead, having failed to detect any signs of life after watching her breathing and pulse. Two hours after her supposed death, the child was washed all over, bandaged, and carried upstairs (from the cellar-kitchen in which she had lain throughout her illness), and "laid out" on a coffin-board. At about 7 p.m., the mother and friends were startled by the cry "Mother" coming from the upper room, and the girl was found on the top of the stairs. Strangely enough, it would appear that she has not been rendered materially worse by this occurrence. She has since taken very little food, and frequently faints for a few minutes; her pulse is small and very slow (between fifty and sixty.) It is thought that the so-called trance was a prolonged fainting fit, which might have been much shortened had warmth and proper restoratives been applied.—*British Medical Journal.*

International Health Exhibition.

LONDON, 1884.

FOURTH PAPER.

CLASSIFICATION OF EXHIBITS.

Division I.—Health (*continued*).

Group 5a.—METEOROLOGY IN ITS RELATION TO THE STUDY OF PUBLIC HEALTH.

Class 46a. Meterological Instruments, such as are used in climatological investigations; Barometers, Aneroids, Thermometers, Earth Thermometers, Thermometer-stands, Hygrometers, Anemometers, Air-meters, Rain-gauges, Automatic Meteorological Apparatus, Sunshine-recorders, Evaporation-gauges, Ozone Papers, Ozonometers, &c.

„ 46b. Diagrams, Models, and Apparatus Illustrative of (*a*) the Climatal Conditions prevaling in various parts of the World; (*b*) the Relations between Health and Disease; (*c*) Rainfall, Percolation, Evaporation, and Flow from Ground; and (*d*) other subjects embraced by the Exhibition.

Division II.—Education.

Group 6.—EDUCATIONAL WORKS AND APPLIANCES.

Class 47. Crèches and Infant-schools.—(*a*) Apparatus and Fittings for Crèches and Infant-schools; (*b*) Games, Toys, and Kindergarten Amusements; (*c*) Models and Appliances for Teaching; (*d*) Examples of School Work.

„ 48. Primary Schools.—(*a*) Apparatus and Fittings; (*b*) Models and Appliances for Teaching; Text-books, Diagrams, and Examples; (*c*) Specimens of Work in Elementary Schools.

„ 49. Domestic Economy and other Forms of Technical and Industrial Education for Girls.—(*a*) Models and Apparatus for the Teaching of Cookery, House-work, Washing and Ironing, Needlework and Embroidery, Dressmaking, Artificial Flower-making, Painting on Silk, Pottery, &c.; (*b*) Specimens of School Work.

„ 50. Handicraft Teaching in School for Boys.—(*a*) Apparatus and Fittings for Elementary Trade Teaching in Schools; (*b*) Specimens of School Work.

„ 51. Science Teaching.—(*a*) Apparatus and Models for Elementary Science Instruction in Schools; Apparatus for Chemistry, Physics, Mechanics, &c.; (*b*) Diagrams, Copies, Text-books, &c.; (*c*) Specimens of the School Work in these subjects.

„ 52. Art Teaching.—(*a*) Apparatus, Models, and Fittings for Elementary Art Instruction in Schools; (*b*) Diagrams, Copies, Text-books, &c.; (*c*) Specimens of Art-work, Modelling, &c., in Schools.

„ 53. Technical and Apprenticeship Schools.—(*a*) Apparatus and Examples used in Primary and Secondary Schools for Teaching Handicrafts; (*b*) Models, Plans, and Designs for the Fitting up of Workshop and Industrial Schools; (*c*) Results of Industrial Work done in such Schools.

„ 54. Schools for the Blind and for the Deaf and Dumb.—(*a*) Apparatus and Examples for Teaching; (*b*) Specimens of School Work.

„ 55. Literature, Statistics, and Diagrams relating to Group 6, and to the Effects of "Cramming" and Overwork on the Young, &c.

„ 56. Collective Displays of School Work and Appliances. School Museums.

„ 57. Machinery and Appliances relating to Group 6.

Table Showing with which Classes the various Sub-Committees Deal

Classes	1—12	Food.
„	13—19	Dress.
„	20	Construction and Fittings.
„	21—23	Water Supply and Sanitation.
„	24—26	Heating, Lighting, and Ventilating.
„	27	Water Supply and Sanitation.
„	28—31	Construction and Fittings.
„	32—33	Water Supply and Sanitation—Construction and Fittings—Heating, Lighting and Ventilating.
Classes	31a—31b	Ambulance.
„	34—40	School and Education.
„	41—46	Workshop.
„	46a—46b	Meteorological.
„	47—57	School and Education.
		Library.
		Laboratory.
		India.

Sanitary Appliances, Etc.

ALLEN'S BRONCHITIS KETTLES.

Messrs. Allen, of 21, Marylebone-lane, Oxford-street, London, W., have sent us one of their Bronchitis Kettles, adapted for the treatment of that disease, and of asthma, croup, and allied conditions. Nothing more ingenious in the way of a handy apparatus has been invented. The "Kettle," as may be seen from the illustration, is adapted either for being set on a fire, or for being heated by a lamp. By this means steam vapour is readily generated; and by aid of a series of tubes and mouth-pieces, any particular exigency which appears in the treatment of a case of bronchitis can be met. A "Medicator" or "Receiver" is supplied with the kettle. This is a perforated receptacle, which can be attached to the opening on top of the boiler whence the steam issues; and when filled with any medicinal substance, such matter is vaporised by the steam, and thus becomes available for the treatment of disease. The tubes of the kettle are jointed, for convenience of packing, and can be used with a "spreader," if preferred. The felt in the spreader may, when saturated with a drug, also become available for the diffusion of medicated vapour. We can readily understand, from an inspection of these kettles, and from the knowledge of their simplicity and satisfactory working, how they have become almost universally adopted by medical men for the treatment of all lung diseases requiring either ordinary steam vapour or medicated vapour. The apparatus cannot get out of order save through wilful neglect, and the want of all complexity and intricacy of details renders these "Kettles" favourite means for home

treatment of ordinary colds. When we consider the clumsy means often used for the production of vapour, and the unsatisfactory results attained by ordinary methods of steaming, the advantages of these "Kettles" become plainly apparent. We would recommend a Bronchitis Kettle to be ranked amongst the household goods of every family. Especially in cases where children are concerned, and where the production of hot steam vapour, with all its soothing properties, is required—often at a moment's notice—the value of Messrs. Allen's invention will be highly appreciated.

Among Messrs. Allen's other inventions we are glad to note their "Portable Vapour Baths," and their "Inhalers, and Nursery Kettles." Their "Spray Apparatus" for the throat is also a marvel of cheapness and simplicity; while we have pleasure in recommending to the notice of our readers their "Improved Enema and Douche." Those who are in search of handy and reliable domestic apparatus for the treatment of disease cannot do better than pay Messrs. Allen's emporium a visit.

GRISCOM'S ELECTRIC MOTOR FOR SEWING-MACHINES, &c.

In answer to several inquiries we beg to state that the above "Motor" can be seen at work at the depôt, 2, Scott's-yard, Bush-lane, Cannon-street, London, E.C. From a health point of view, such an invention is of high importance. Many complaints are either induced or aggravated by the exertion required to work a sewing-machine, and the value of a "motor" readily applied, and of sufficient power, such as that above noted, becomes plainly apparent. The "Motor," we understand, will be exhibited at the forthcoming "Health Exhibition."

[Erratum.—Through a slip of the pen in referring to Thomson's "Nerve Tonic," the address of Mr. Thomson, Chemist, Glasgow, was given in Health, No. 47, p. 349, as 17, *London*-street. The proper address is 17, Gordon-street, Glasgow.]

Our Letter : Box

"Conference [maketh] a ready man."—*Bacon.*

NOTICES TO CORRESPONDENTS.

All Communications for the Editorial Department (including specimens of Sanitary Appliances, &c.), to be addressed to "The Editor of Health," 74-76, *Great Queen-street, London, W.C. Those intended for the Publishing Office to be sent to* "The Publisher," *at the same address.*

LETTERS TO THE EDITOR.

CREMATION.

Sir,—Your contributor, Mr. Williams, displays a sad lack of knowledge upon the subject he has ventured to write about, viz., "An Alternative to Cremation." He seems to have lost sight of the fact (long since admitted by very many of our scientific investigators) that the human body is composed of about two-thirds (or 66 per cent.) of "fluid matter." His idea of a sort of pyramid composed of several hundred of decomposing bodies, built in with a concrete wall, is, to say the least of it, preposterous. Any such pyramid so constructed would soon become saturated from within, and give off gases highly prejudicial to health. Apart from this serious fact, the idea is wholly impracticable.

I would therefore suggest that until we are educated up to the "cremation point," there is no better plan of disposing of our dead than the "earth to earth system" in simple "wood coffins" only, the earth itself, by its known deodorising properties, being a valuable safeguard against the spread of disease germs.* The use of "metal coffins," brick graves, vaults, and catacombs should be forthwith and for ever abandoned.—Yours faithfully,

Camberwell, *March* 7, 1884. W. D.

COMMON SODA FOR COOKING PURPOSES.

Sir,—I am glad to find that you call attention in a recent number of Health to the ignorant and injurious practice of using common soda in boiling vegetables, with the idea that it makes them green; and again, to hurry the cooking when late. Chemists say that the advantage of soda for this purpose is that it "precipitates the lime present in hard water;" but it may be asked whether the employment of such a caustic agent as the potash of commerce is justified at all, more especially when it is remembered that in the vegetable kingdom various kinds of potash are found, which would naturally and safely fulfil all the purposes sought to be obtained by the very dangerous, because excessive, use of the common washing soda in the hands of ignorant cooks.—I am, Sir, obediently yours, M. A. B.

STERILIZATION OF LIQUIDS.

Sir,—We are glad to see from your reply to "Sanitary Engineer," in a recent number of Health, that others are taking an interest in the above question. Although we agree that boiling gives some protection, we think a reference to more recent publications shows that certain important points are still *sub judice*. In the proceedings of the Royal Society for 1871 there is a paper by the late Dr. Crace-Calvert, in which he draws the conclusion from a series of experiments, that protoplasmic life is but slightly affected by a temperature of 100° C., and that even at a temperature of 150° C. it is not entirely destroyed, excepting in the case of gelatine. In all other fluids he found a temperature of about 200° C. necessary to completely destroy the life. Referring to Dr. Beale, Dr. Crace-Calvert quotes his (Dr. Beale's) view that living forms might live, though exposed, under certain conditions, to a temperature of 177° C. Dr. Buchmer states, as the result of his experience, that one hour's heating to about 110° C. is required to sterilize a liquid completely. Dr. Cameron, M.P., in a paper read not long ago before the Philosophical Society of Glasgow, explains this in the following way:—Microbes are killed on being submitted to a boiling heat, sometimes even at a lower temperature; but as to their spores, from which their succeeding generations spring, there is almost no killing them, and the latter have been known to survive eight hours' boiling. This is precisely also Dr. Tyndall's experience, as stated in 1877, in a lecture at the Royal Institution.

All these experiments refer in the main to the destruction of ordinary bacteria, and not of the germs, which we assume are the cause of certain diseases in man. Though some of the latter have been isolated with more or less probability—thus quite lately the bacillus of cholera by Dr. Koch—almost all our knowledge of this nature is based upon the supposition of analogy with the ordinary bacteria. Thus we have it upon the authority of Mr. Huxley that the epidemic diseases—splenic fever, pig typhoid, and cholera of fowls—are invariably caused by bodies of the nature of bacteria, and that there is every reason to believe that analogous diseases in man are caused by similar organisms.

Regarding the destruction of disease-germs by filtration, if we may at all draw conclusions from the action upon ordinary bacteria, we beg to point to the papers by Prof. Bischof, read before the Royal Society in 1877 and 1878, and the experiments by the late Mr. Hatton, communicated to the Chem. Soc. in 1881. Corroborated as these are by the XIX. Army Medical Rep. and other publications, there can scarcely be a doubt that spongy iron has an antiseptic action on living organisms contained in water. Practical indications, such as those in the XIX. and XX. Army Medical Reports, are also not wanting to show that disease-germs themselves are destroyed by filtration of water through spongy iron. May we, therefore, venture to inquire whether, when speaking of a "purely filtering process," you meant to include filtration through spongy iron ?*—We remain, sir, your most obedient servants,

The Spongy-Iron Domestic Filter Company.

22, New Oxford-street, W.C., *March* 7, 1884.

QUERIES AND ANSWERS.

GENERAL.

Omaha.—We do not know the firm to which you allude, but we should think the business they transact, judging from their circular, is of a somewhat shady description.

S. Motor.—The description of the spring-motor, to which you allude, appeared in the *Times* about the date at which the notice appeared in Health. Your best plan would be to consult a file of the *Times* of the date in question, when you will meet with the article describing the motor.

B. A.—Bread is not, as you seem to think, a single and simple food; but a compound food consisting of water, gluten, starch, minerals, and fat. Each of these substances is, physiologically, a food on its own account.

C. E.—The late Dr. Hall, of Sheffield, gave the following as the average duration of life of Sheffield artisans:—Dry-grinders of forks, 29 years; razors, 31 years; scissors, 32 years; edge tools and wool shears, 32 years; spring knives, 35 years; files, 35 years; saws, 38 years; and sickles, 38 years.

Interested.—It would seem as though the condition to which you refer was the cause of the outbreak, but the question is a difficult one.

Algoa.—See article on consumption in Health, No. 47.

Hilda B.—1. Papers will be commenced at an early date. 2. All the blood which nourishes the body, or any part thereof (*i.e.*, pure or arterial blood), comes from the left ventricle of the heart. The lung-tissues are all nourished by blood conveyed in arteries which are branches of the *aorta*, or main artery, arising from the left ventricle.

W. D.—A brine or pickle for pork may be made thus:—Brown sugar, bay salt, and common salt—of each 2 lb.; saltpetre, ½ lb.; water, 1 gallon. Boil gently and remove the scum. Another pickle is made by mixing 12 lb. of salt, 2 lb. sugar or treacle, and ½ lb. of saltpetre, with sufficient water to dissolve the ingredients. Hams may be cured as follows:—Mix 5 oz. nitre with 8 oz. of coarse sugar. Rub this in the ham, and in twenty-four hours rub in 2 lb. of salt, and in fourteen days 2 lb. more. This will cure a ham of 20 lb. weight, and it should lie in the salt four or five weeks.

A. H. Johnson.—Kindly specify to us the exact particulars you wish for regarding the dispensaries. The subject is a wide one; but if you will inform us of your wants, we shall endeavour at once to aid you to the best of our ability.

Diamond.—We agree entirely with your remarks, and may direct attention to the subject at an early date.

* It is, to say the least, highly questionable, if earth is any such safeguard or possesses any destructive power over disease germs. Recent researches seem to show that disease germs may retain their powers after burial for long periods.—Ed. H.

* Our own belief is that such germs cannot be *destroyed* by any filtration whatever. We shall be glad to publish any evidence bearing on this important point which our correspondents may send us.—Ed. H.

SANITARY.

Scientist.—Precipitation processes for sewage are well known; such as that by lime, magnesia, sulphate of iron, or alumina, &c.

D. O.—A very decided connection has been proved to exist between dampness of the soil and the occurrence of consumption. Dr. Buchanan's reports show this very clearly; in such a case the dampness may be considered a condition rather than a cause of the disease.

MEDICAL.

P. P. M.—See and follow advice given to "Dunedin" in No. 48 of Health. Beware of quacks, of whom you seem to have had some experience in Glasgow. You suffer from no disease, but only require time and attention to your general health to regain your vigour.

T. E. M. S. D.—By your own account you are in good health. What you complain of is in reality a sign of health. You have evidently started with the idea that you suffer from some ailment; and it is this morbid idea that is worrying your mind. Cold sponging, active exercise in the open air, and nourishing food, but without stimulants, should cure you. You are in a fair way to fall into the hands of quacks if you continue to think of yourself as you at present do.

Innocence.—Not usual, but often occurs. Use a little carbolated vaseline, or visit a surgeon, who will be able to reassure you that all is well.

Hairy Face.—1. Plain diet and avoidance of chills, and the following powders:—Sulphide of lime, 24 grains; sugar of milk, half an ounce; mix. Keep in a well-stoppered bottle and take as much as will cover a sixpence every four hours. The following lotion may also be found useful:—Flowers of sulphur, one teaspoonful; glycerine, two tablespoonfuls; rose water, half a pint; mix. 2. There is no certain method of removing hair permanently, except an electrical form of treatment. In your case we should advise you to shave the whiskers for some time.

An Anxious Inquirer.—Your case is one which certainly demands sympathy, but you ought to be aware that by taking aperient medicines to the extent you do, you are simply aggravating the evil of which you complain. We should advise you to thoroughly overhaul the general condition of your health. In all probability enemas should be tried for a time, at least, and, in place of other medicines, we should recommend you to take one drop of the tincture of nux vomica three or four times a day. If this is not followed by good results, you might try the effect of morning doses of mineral waters, such as Æsculap or Friedrichshall. We warn you, however, that should your ailment continue to resist simple treatment, you must place yourself in the hands of a physician. We warn you once more of the danger of trifling with purgative medicines. An increased amount of open-air exercise might also be advisable.

Roderick.—1. Tonic not to be continued at present; its only use is that of bracing up the system. Leave it off and attend to general health. 2. See advice to "Mona" (No. 47, Health). Use injection each evening for a time. 3. Irritation due to thread-worms. 4. Simply attention to general health and avoidance of all stimulants. See to your drinking water (as to its purity) in the East; about ½ oz. tincture perchloride of iron should be used as an injection to the pint of water.

A Methodist.—Take cod-liver oil (a dessertspoonful daily after food) for a time, and inhale vapour arising from a pint of hot-water to which ten drops tincture of iodine have been added. Do this thrice daily for a few days and note result. Chronic catarrh, like yours, will only leave you when your general health is established. A change to the sea would likely effect a cure.

T. H.—See and use lotion for hair recommended to "Russell" in Health, No. 48. Try tepid sponging if you find the cold to disagree with you.

W. C.—Such an affection is rather a symptom than a disease. We advise you to see a physician, who will examine the secretion, and who can alone by such examination discover a cause. Glad to send you address of a reliable authority, if desired, on receipt of stamped addressed envelope.

Burnbank.—Our best advice is that your friend should consult the surgeons of one of the Glasgow Eye Dispensaries. No advice of ours can avail in such a case, as the condition is one requiring treatment at the hands of an eye-surgeon.

Carl St. John.—Don't be either morbid or disheartened. You will get quite well in time. Read and follow advice given to "Dunedin" in Health, No. 48. Write again in three weeks or so, and let us hear how you are. Cases like yours are common, but get quite well under above treatment.

J. B. B.—1. Yes; abstinence very desirable. 2. Yes; with a difference for the warmer season. 3. No preventive except strict attention to general health, looking to purity of drinking water, and taking quinine as a tonic, if out of sorts. 4. Quinine, certainly; also Fellows' "Syrup of the Hypophosphites," and a few aperient medicines—Lamplough's "Pyretic Saline" is a safe saline aperient. As a disinfectant try "Sanitas" or "Chloralum."

Horatius.—We fancy that Bournemouth or Dawlish comes as near your wants as any place. Yours is a difficult case to suit. Rothesay, on the Clyde, should certainly suit you in spring and summer. In winter, St. Leonards and Hastings; or have you made a special survey of the Isle of Wight? There, we fancy, you would meet with one or more places to suit you. Glad to assist further, if necessary.

D. W.—See advice to "Carl St. John" in present number of Health.

Battery.—We should recommend you to try a Pulvermacher's Chain Electrical Battery (see advertisement of these appliances in Health). They are thoroughly genuine, and we have proved them to create a strong electrical current. Clothe the loins in addition warmly with flannel, and take hot salt water baths occasionally.

C. A. M.—We cannot undertake to search Health for you, and to forward you the number containing a reply to your question. Just consider what an existence ours would be, if all our correspondents were as unreasonable in their request as you are.

Veto.—You are in a low state of health, and suffer from a form of chronic cold in the head. We advise you to try a change to the seaside for a time. This, with nourishing food, is the most effective and speedy cure. See to your general health. Take a little "Æsculap" water each morning, and you might also try 10 drops *Fer Bravais* thrice daily in water after food. Inhaling the steam of a pint of hot water to which a teaspoonful of "Friar's Balsam" has been added will also do good, but beware of cold after so inhaling.

Jane Rose.—You must describe your symptoms more fully, also mode of life, habits, &c. The cloudy appearance may itself be of no great importance. Try first the effect of avoiding all stimulants, and of drinking plenty of potash water. Glad to be of further service.

McCulloch.—There is no specific for "growth," save nutritious food, judicious exercise (to stimulate the appetite), and a change of air. We should advise you to see to your food, to try dumb-bells or bar-exercises, cold bathing, if it agrees, and open-air walking daily.

R. D. J.—See to your general health. Do not eat late at night. Try a little "Æsculap" mineral water each morning, and take a little "Pepsine" after meals. Use plain Vaseline as an outward application for the irritation, and if not better write again. Remember that in a case like yours the condition of the bowels should be your first concern. A surgeon might assist you by advice as to the irritation of which you complain.

N. E. V.—Yes; you will get quite well in time. Don't be anxious, even if what you complain of should occasionally persist. It is often a sign of perfect health. Persevere with the treatment we ordered you.

Pænus.—The case you name is eminently one for medical advice. Only in this way can benefit and relief be obtained. A doctor will be very sympathetic with such a case, which, occurring as it does at such an age, demands early attention. This is our earnest advice to you, and you should follow it at once. The condition complained of may readily enough be ameliorated.

A. B.—No; we regard your symptoms as due to digestive disorder. Our advice to avoid strain is simply to give heart and all other organs a rest. When your general health improves, your symptoms will leave you.

Conway.—Don't be anxious; read and follow advice to "Dunedin," in Health No. 48. You will get quite well by attending thereto.

North West.—Yours is one of those common cases in which overwork and over-exertion are now bringing in their harvest of ill-health. All you need is rest, careful living, avoidance of exertion, and nourishing but non-stimulating food. Take "Pepsine" with your food for a time, and feed on eggs, milk, nourishing soups, fish, &c. You will get quite well by attention to the details of your daily life. A change to the sea for a time might do you much good. We can send you the address of a reliable medical authority, if you wish it, on receipt of stamped addressed envelope.

Victim.—Let your food be largely liquid for a time. Eggs, milk, with soups, &c.; light boiled white fish, toast, &c. Give up tea and coffee entirely. By giving the stomach rest for a time, and by also taking a little "Pepsine" with your food, you will get well. Let us hear how you are in a few weeks.

R. S. L.—The signs in the prescription (as you give it) respectively mean, distilled water one drop; yeast 100 grains; and cane sugar 200 grains. It is possible that instead of "one drop" the distilled water may be one quart, and the "grs." of your prescription may be *grammes*, if it was taken from a foreign source. A "gramme" is nearly sixteen grains English weight. Your writing is by no means distinct.

[*Continued on page* 384.

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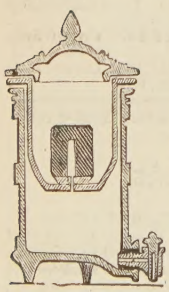

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